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Oral potassium supplementation in surgical patients

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ABSTRACT

Hospital inpatients are frequently hypokalaemic. Low plasma potassium levels may cause life threatening complications, such as cardiac arrhythmias. Potassium supplementation may be administered parenterally or enterally. Oral potassium supplements have been associated with oesophageal ulceration, strictures and gastritis. An alternative to potassium salt tablets or solution is dietary modification with potassium rich food stuffs, which has been proven to be a safe and effective method for potassium supplementation. The potassium content of one medium banana is equivalent to a 12 mmol potassium salt tablet. Potassium supplementation by dietary modification has been shown to be equally efficacious to oral potassium salt supplementation and is preferred by the majority of patients. Subsequently, it is our practice to replace potassium using dietary modification, particularly in surgical patients having undergone oesophagogastrectomy or in those with peptic ulcer disease.

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Hospital inpatients are frequently hypokalaemic.[1] Hypokalaemia is more common in patients with increased potassium losses via the kidney, for example due to diuretics[2] or tubular dysfunction, or via the gastrointestinal tract, secondary to diarrhoea, vomiting or bowel preparation.[3,4] Potassium supplementation is often given to correct hypokalaemia and may be administered parenterally or enterally (via gastric or jejunal feeding tubes or taken orally).

Oral potassium supplements have been associated with oesophageal ulceration.[5–7] They have also been implicated in causing oesphageal strictures[5,8] and gastritis.[9]

Maintenance potassium requirements are 1 mmol/kg/day and when plasma potassium levels are low or falling the minimal excretion of ionized potassium is 0.2 mmol/kg/day.[1,10] Low plasma potassium levels can cause life threatening cardiac arrhythmias and weakness of respiratory muscles.[10] All patients with potassium levels below the lower limit of normal should be treated. In some patients (for example, those with cardiac disease, atrial fibrillation or those on digoxin) it is prudent to maintain a potassium level towards the upper limit of normal.[1]

Dietary modification involving potassium-rich food-stuffs has long been recognized as a potential method for potassium supplementation.[11] Norris et al. proved this as a safe, cheaper and equally efficacious alternative to potassium salt medication and the majority (79%) of patients preferred diet supplementation.[12]

Oral potassium tablets typically contain around 12 mmol of potassium and should be administered with food to reduce their alimentary side effects, which include nausea and vomiting.[12] This is equivalent to one medium banana.[12]

Bananas are a well accepted source of potassium; 1 g of banana contains 1 mmol of potassium.[13] Other potassium-rich foods include baked potato (one baked potato contains 22 mmol potassium) and prune juice (9 mmol in 150 ml) or orange juice (4 mmol in 150 ml).[12]

The potassium deficit for a reduction in serum potassium concentration is variable, but is typically around 100 mmol potassium for a 0.3 mmol/l reduction in serum potassium.[1] Patients with hypokalaemia typically receive approximately 72 mmol of potassium salt supplementation a day in the form of six dissolvable tablets. This is alternative to six

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bananas. Sando-K contains 12 mmol potassium and costs £1.53 for 20 tablets,[14] a cost of 0.6 pence/mmol potassium. Bananas in my local supermarket cost 77 p/kg (6 medium bananas) equivalent to 1.1 pence/mmol potassium. A 20 mmol ampoule of potassium chloride costs 48 pence,[14] the equivalent of 2.4 pence/mmol.

Subsequently, our practice has been to give oral potassium supplementation by dietary modification to surgical patients when this is possible, particularly in those patients who have undergone oesophagogastric resection and those with upper alimentary disease such as reflux oesophagitis and peptic ulcer disease.

Conflict of interest
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